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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------|-------------|----------------------|---------------------|------------------|
| 10/008,774 | 11/13/2001 | Markus Doetsch | L&L-I0197 | 4722 |
| 24131 | 7590 | 03/01/2005 | EXAMINER | |
| LERNER AND GREENBERG, PA | | | LUGO, DAVID B | |
| P O BOX 2480 | | | ART UNIT | PAPER NUMBER |
| HOLLYWOOD, FL 33022-2480 | | | 2637 | |

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/008,774 | DOETSCH ET AL. | |
| | Examiner | Art Unit | |
| | David B. Lugo | 2637 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 13 November 2001.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-7 and 9-18 is/are rejected.
 7) Claim(s) 8 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 15 February 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 2/4/02.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 8 is objected to because of the following informalities:

Claim 8, line 4, it is suggested that “that” should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 5, 12, 13, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Pridham et al.

5. Regarding claims 1 and 16, Pridham et al. disclose a receiver in Fig. 13 comprising a signal receiving device for providing K analog reception signals, a signal pre-processing circuit connected to the signal receiving device including K A/D converters connected in parallel for independently sampling the K reception signals with a sufficient sampling rate for providing K digital signals, where the K reception signals are generated from N_E sensors by separating each of the N_E inputs into in-phase and quadrature components (see demodulation component – Fig. 5), and sampling is performed on the in-phase and quadrature components for each of the inputs

(see complex sampling component – Fig. 5). Pridham et al. further disclose a filter device having N digital filters (lowpass filters) connected in parallel, and a conversion device including a beamformer component and zero padding components, configured such that N is less than K .

6. Regarding claims 4, 5 and 18, the conversion device includes $K > 1$ zero-inserting elements connected in parallel.
7. Regarding claims 12 and 13, Pridham et al. further disclose that the receiving device includes $K/2 > 1$ reception sensors, where $K/2$ equals N_E .
8. Claims 1, 2, 9, 10, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tatsuta et al. U.S. Patent 5,712,879 (disclosed by applicant).
9. Regarding claims 1, 15 and 16, Tatsuta et al. disclose a mobile communications receiver comprising a signal receiving circuit that obtains in-phase and quadrature signals by performing quadrature phase detection on the modulated signal (col. 1, lines 28-33), the receiver further including a pre-processing circuit as shown in Fig. 7 having K A/D converters, a filter device connected downstream from the A/D converter, and a conversion device 11 configured between the A/D converter device and the filter device, where the filter has N filters for filtering the K digital signals, where $N < K$.
10. Regarding claim 2, the number of filters N equals 1.
11. Regarding claims 9 and 10, Tatsuta et al. disclose that the K reception signals are generated by splitting the reception signal into an in-phase reception signal and a quadrature reception signal (col. 1, lines 28-33, col. 9, lines 45-48), and are considered to be received by a single reception sensor.

12. Claims 1, 2 and 11, 13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. U.S. Patent 5,544,128.

13. Regarding claims 1 and 16, Kim et al. disclose a receiver comprising a signal receiving device providing K reception signals, a signal preprocessing-circuit including K A/D converters, a filter device comprising N filters 90 downstream from the A/D converters (Fig. 3) and a conversion device between the A/D converters and the filter device, where K and N are greater than zero and the conversion device is configured such that N is less than K.

14. Regarding claim 2, the number of filters N equals 1.

15. Regarding claims 11 and 13, Kim et al. disclose K > 1 sensors (transducers – Fig. 1).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsuta et al. and Matt U.S. Patent 6,272,181.

18. Regarding claims 3 and 17, Tatsuta et al. disclose a mobile communications receiver as disclosed above, where the conversion device comprises a switch 11 (Fig. 7), but does not expressly disclose that the conversion device includes a multiplexer for multiplexing the K digital signals into N signals and providing the N signals to N inputs of the filter device.

19. However, multiplexers and switches are well-recognized art equivalents. For instance, Matt U.S. Patent 6,272,181 discloses a circuit in Fig. 2, where a multiplex unit is used to combine signals from two separate paths into a single path.

20. It would have been obvious to one of ordinary skill in the art to use a multiplexer in place of the switch of Tatsuta et al., as they are well-recognized art equivalents.

21. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pridham et al.

22. Regarding claims 6 and 7, Pridham et al. disclose a receiver as disclosed above, but do not disclose that the degree of the filter is between 5 and 20, and in particular between 10 and 18.

23. However, the degree of a digital filter is selected based on design choice. Therefore, it would have been obvious to one of ordinary skill in the art to select a degree of the filter between 10 and 18 as a matter of design choice.

24. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsuta et al. in view of Liang et al. U.S. Patent 6,314,147.

25. Regarding claims 13 and 14, Tatsuta et al. disclose a receiver as disclosed above, but do not disclose that the receiver includes a plurality of receptor sensors, each having a directional reception characteristic for sensing radio signals in a predefined spatial segment.

26. Liang et al. disclose an antenna array comprising a plurality of spatially-separated receiving antennas.

27. It would have been obvious to one of ordinary skill in the art to use a plurality of spatially-separated receiving antennas as disclosed by Liang et al. in the receiver of Tatsuta et al. for diversity reception.

Allowable Subject Matter

28. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and amended to overcome the objection set forth in this Office action.

29. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach that one of the N digital filters includes a plurality of single digital filters, and sampling rate reduction circuits configured in series in an alternating fashion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Lugo whose telephone number is 571-272-3043. The examiner can normally be reached on M-F; 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David B. Lugo
2/22/05

Khai Tran
KHAI TRAN
PRIMARY EXAMINER 2/25/05